

## UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)								DATE <b>February 1999</b>		
BUDGET ACTIVITY <b>7 - Operational System Development</b>				PE NUMBER AND TITLE <b>0203758A Digitization</b>				PROJECT <b>D374</b>		
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D374 Horizontal Battlefield Digitization	91248	46240	28180	26830	26341	25650	27119	27910	Continuing	Continuing

**A. Mission Description and Budget Item Justification:** Battlefield Digitization is a strategy that allows warfighters, from the individual soldier and platform to echelons above corps, to share critical situational awareness (SA) and command and control information. It applies digital information technologies to acquire, exchange, and employ data throughout the battlespace, providing a clear and accurate common relevant picture of the battlespace for leaders at all levels. This timely sharing of information significantly improves the ability of commanders and leaders to quickly make decisions, synchronize forces and fires, and increase the operational tempo. Digitization is a means of realizing a fully integrated command and control capability to the platoon level, including interoperability links with joint and multinational forces. The major FY00-01 efforts included in the program element are: 1) The horizontal battlefield operating integration office (Army Digitization Office), responsible for the integration and synchronization of the Army's digitization efforts; coordination of digitization efforts between joint and multi-national forces; and synchronization of combat material and training efforts to develop and deploy Army XXI information technologies. 2) System engineering and integration of physical interfaces and logical mechanisms between and across multiple battlefield operating systems to provide improved capability to operate in the common battlefield picture/SA and common operating environment (COE) dimensions. This will provide enhanced synchronization of maneuver, direct/indirect fires, intelligence and targeting, and reduced fratricide. The goal of Horizontal Battlefield Digitization is to integrate modern information technology into the Army of the 21<sup>st</sup> Century.

**FY 1998 Accomplishments:**

- 1500 Equipped and trained 1Bn test unit and conducted Limited User Test (LUT).
- 3000 Hardware to support IOTE testing.
- 20926 Continued Brigade and Below Command and Control Software/Hardware developments/upgrades.
- 11700 Continued Force XXI Battle Command, Brigade and Below (FBCB2) system engineering and architecture development, modeling and simulation
- 9900 FBCB2 Integration and Testing; training management.
- 1350 FBCB2 Site operations and Integrated Logistics Support at Fort Hood and Fort Huachuca.
- 6349 FBCB2 Program Management.
- 4848 Continued test, simulation, experimentation and evaluation of prototype hardware and software.
- 3385 System Engineering/Development/Platform Integration.
- 7616 Interoperability: Abrams/Bradley/FBCB2 digital connectivity, and Battlefield Interoperability Program.
- 3432 Completed development of FBCB2 software interface with Abrams and Bradley.
- 5665 Continued rapid acquisition of software enhancements for the Tactical Internet.
- 1885 Analyzed (including modeling/simulation) overall digitized system of systems performance.

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<p><b>FY 1998 Accomplishments:</b> (continued)</p> <ul style="list-style-type: none"> <li>• 3279 Thorough validation of digital requirements/architecture to ensure realistic/adequate data flows, mission thread analysis, interoperability, human resource engineering, security, and physical layout.</li> <li>• 1320 Integration tools, plans, specifications, and other training, logistics, interface, and configuration management products.</li> <li>• 5093 Support integration of Tactical Personal Communications Systems for wireless inter and intra-Tactical Operations Centers.</li> </ul> <p>Total 91248</p> <p><b>FY 1999 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• 4915 Data engineering evaluation and analysis testing, experimentation, and interrelated simulation of hardware/software.</li> <li>• 4099 System/Platform Integration of heavy/light forces; synchronization assessments, battlefield digitization impact studies, and system of systems issue resolutions.</li> <li>• 2300 Joint and Coalition interoperability programs for improving digitization including, C4I Coalition Warfare, Command and Control System Interoperability Program (C2SIP) efforts; specific tasks to include: database development, operational system architecture development, and Multilateral Interoperability Program (MIP) Phase I testing and Phase 1 demonstrations.</li> <li>• 1445 Analysis (including modeling/simulation) to predict overall digitized system of systems performance.</li> <li>• 17320 Continue software/hardware integration, prototype development, and initiate testing of FBCB2/Embedded Battle Command on Abrams tanks and Bradley fighting vehicles.</li> <li>• 1850 Thorough validation of digital requirements/architecture to ensure realistic/adequate data flows, mission thread analysis, interoperability, human resource engineering, security, and physical layout.</li> <li>• 1885 Integration tools, plans, specifications, and other training, logistics, interface, and configuration management products for the 66 TRADOC identified systems.</li> <li>• 6795 Evaluate emerging interfaces to ensure interoperability across all functional areas including: 1) Development of EBC on VxWorks, SSAT for Beta version and ADA bindings solutions for the Aviation communications requirements for full tactical internet (TI) connectivity/mobility and support of integration into each platform; STORM stimulator interoperability; TOC server integration; Aviation integration into the TI, and STAMIS/CSSCS/MTS integration 2) Resolution to the electronic interface security issue and the TI interface 3) Support system integration of interoperability analysis and design and demonstration of capabilities.</li> <li>• 1875 Digital Intelligence Situation Mapboard.</li> <li>• 1875 Digitization research at Foot Hood.</li> <li>• 1881 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs</li> </ul> <p>Total 46240</p>		
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<b>FY 2000 Planned Program:</b> <ul style="list-style-type: none"> <li>• 5450 Data engineering evaluation and analysis testing, experimentation, and interrelated simulation of hardware/software.</li> <li>• 4642 System/Platform Integration of heavy/light forces; synchronization and integration of fielding plans, assessments, and resources; battlefield digitization impact studies, and system of systems issue resolutions.</li> <li>• 3388 Joint and Coalition interoperability programs for improving digitization including C4I Coalition Warfare, Command and Control System Interoperability Program (C2SIP) efforts; specific tasks to include: database development, operational system architecture, and Multilateral Interoperability Program (MIP) Phase I testing and the International Remote Command Post Exercise (CPX).</li> <li>• 1700 Analysis (including modeling/simulation) to predict overall digitized system of systems performance.</li> <li>• 2915 Thorough validation of digital requirements/architecture to ensure realistic/adequate data flows, mission thread analysis, interoperability, human resource engineering, security, and physical layout.</li> <li>• 3585 Integration tools, plans, specifications, and other training, logistics, interface, and configuration management products for the 66 TRADOC identified systems.</li> <li>• 6500 Evaluate emerging interfaces to ensure interoperability across all functional areas including: improved locating, tracking, and management of transportation assets; support tactical internet and electronic interfaces required for logistic functions; solution development for Aviation communications requirements for full tactical internet connectivity/mobility, and support system integration of interoperability analysis, design, and demonstration of capabilities to minimize platform modifications to achieve maximum benefits of open architecture.</li> </ul> <p>Total     28180</p>		
<b>FY 2001 Planned Program:</b> <ul style="list-style-type: none"> <li>• 4800 Data engineering evaluation and analysis testing, experimentation, and interrelated simulation of hardware/software.</li> <li>• 4660 System/Platform Integration of heavy/light forces; synchronization assessments, battlefield digitization impact studies, and system of systems issue resolutions.</li> <li>• 3460 Joint and Coalition interoperability programs for improving digitization including C4I Coalition Warfare, Command and Control Information Interoperability Program (C2SIP) through MIP Phase I demonstrations to the International Digitization CPX.</li> <li>• 1800 Analysis (including modeling/simulation) to predict overall digitized system of systems performance.</li> <li>• 2200 Thorough validation of digital requirements/architecture to ensure realistic/adequate data flows, mission thread analysis, interoperability, human resource engineering, security, and physical layout.</li> <li>• 4000 Integration tools, plans, specifications, and other training, logistics, interface, and configuration management products for the 66 TRADOC identified systems.</li> <li>• 5910 Evaluate emerging interfaces to ensure interoperability across all functional areas including: improved locating, tracking, and management of transportation assets; support tactical internet and electronic interfaces required for logistic functions; Combat Service Support and Medical Communication for Combat supporting system integration of interoperability analysis, design, and demonstration of capabilities to minimize platform modifications to achieve maximum benefits of open architecture.</li> </ul> <p>Total     26830</p>		
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DATE  
February 1999BUDGET ACTIVITY  
**7 - Operational System Development**PE NUMBER AND TITLE  
**0203758A Digitization**PROJECT  
**D374**

<b>B. Program Change Summary</b>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (FY 1999)	94103	45007	29445	28248
Appropriated Value	71560	47007		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-2457	-767		
b. SBIR / STTR	-1733			
c. Omnibus or Other Above Threshold Reduction	+24428			
d. Below Threshold Reprogramming	-550			
e. Rescissions				
Adjustments to Budget Years Since FY 1999 PB			-1265	-1418
Current Budget Submit (FY 2000/2001,PB)	91248	46240	28180	26830

## Change Summary Explanation:

FY 1998 - Congressional reprogramming for Digitization – (\$16.2M FBCB2 Software development and hardware to support IOTE testing, and \$8.8M for Systems Integration.)

FY 1999 - Congressional \$2M plus-up for digitization research at Fort Hood.

**C. Other Program Funding Summary:** Not applicable

**D. Acquisition Strategy:** To validate/demonstrate concepts and requirements, near term efforts were focused on developing a seamless battlefield software architecture and digitized appliqué hardware systems supporting experimentation to include: evaluation of the horizontal battlefield digitization resources of systems, acquisition, integration, and testing of digital capability across multiple command and control, communications, sensor and weapons platforms. The result will be an integrated digital capability designed to meet the near-term requirements of the First Digitized Division by end of FY00 and First Digitized Corps by the end of FY04. Also, it supports the Army's role in joint and multi-national digitization programs; coordinates/manages security, vulnerability and "Red Teaming" functions; and manages Manpower and Personnel Integration (MANPRINT), modeling and simulations, and analysis.

(Starting in FY99, FBCB2 was transferred to a new program element 0203759A entitled, "Force XXI Battle Command, Brigade and Below.")

<b>E. Schedule Profile</b>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
Army Tactical Cmd & Ctrl Info Sys (ATCCIS)		1Q,4Q						
National Tests								
ATCCIS International Test		1Q,4Q						
ATCCIS Evaluation Cycles		2Q,3Q	1Q					

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<b>E. Schedule Profile</b>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
US/UK Lab Interop Demo		4Q						
Develop ATCCIS International Stds	4Q		2Q					
Develop International C2 Op Arch.	4Q							
- MIP Phase I Testing		2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q		
- MIP Phase I Demos			1Q, 2Q	1Q,2Q				
Develop International (ABCS) Gateway (QIP)		1Q						
Tactical Personal Communications	3Q	4Q						
Corps Warfighter Exercises	4Q	1Q	2Q		2Q, 3Q	2Q, 3Q	2Q, 3Q	2Q, 3Q
- Operational Readiness Eval.		2Q,3Q,4Q						
Limited User Test (LUT)	4Q							
Integrate FBCB2 in Abrams tanks and Bradley fighting vehicles	4Q	4Q						
- FDD Hardware Contract Award		3Q						
- Equipping First Digitized Division			4Q					
- Force Development Test & Evaluation		4Q						
- Initial Operation Test & Evaluation			1Q					
- Initial Operation Capability				2Q				
- EBC Follow-on Tests			2Q					
Evaluate electronic interface to tactical internet and to C2 systems	4Q	4Q	4Q					
Conduct analysis to support system design, experimentation, and implementation			2Q,3Q	1Q,2Q				
Light Force Digitization					1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	
First Digitized Corps			1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	

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## ARMY RDT&amp;E COST ANALYSIS (R-3)

DATE

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BUDGET ACTIVITY

7 - Operational System Development

PE NUMBER AND TITLE

0203758A Digitization

PROJECT

D374

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. System Integration	MIPR/PWD	Various	47230	10530	Various	13000	Various	12110	Various		82870	
b. International Digitization	Various	Various	12800	2300	Various	3388	Various	3460	Various		21948	
c. Technical Analysis	MIPR/PWD	MITRE Pentagon, McLean, VA	4400	1100	Oct 98	1100	Oct 99	1800	Oct 00		8400	
d. Tank/Brad	CPFF	GDLS Warren, MI / UDLP San Jose, CA	73720	17320	1Q	N/A					91040	
e. Other Govt. Agencies	MIPR/PWD	Various	22832	9699		5920		4988			43439	
Subtotal Product Development:			160982	40949		23408		22358			247697	
II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
f. ADO Office Support (salaries and travel)	N/A	Pentagon	6504	1626		1623		1623			11376	
g. Digitization Plans, Internet, & graphic design support	MIPR/PWD	Signal Corp Pentagon Arlington, VA	4200	1200	Oct 98	1000	Oct 99	1000	Oct 00		7400	
h. Info Ops, System Eng., Integ & Ops Support	MIPR/PWD	Quantum Pentagon, Ft. Monroe, VA, and Ft. Hood, TX	5295	1395	Oct 98	1300	Oct 99	1300	Oct 00		9290	
i. Various	MIPR	Pentagon	720	180	Oct 98	207	Oct 99	207	Oct 00		1314	
Subtotal Product Development:			16719	4401		4130		4130			29380	
III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Other Govt. Agencies	MIPR/PWD	Various	3560	890	Oct 98	642	Oct 99	342	Oct 00		5434	
Subtotal Test and Evaluation:			3560	890		642		342			5434	

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IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a.												
Subtotal Management Services:												
Project Total Cost:			181261	46240		28180		26830			282511	

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